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EXAMINER

MUSA, ABDELNABI O

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/733,734

Applicant(s)

BIRAN ET AL.

Examiner

Abdelnabi O. Musa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The instant application having Application No. 10/733734 has a total of 40 claims pending in the application; there are 3 independent claims and 37 dependent claims, all of which are ready for examination by the examiner.

Oath/Declaration

2. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in **37 C.F.R. 1.63**.

Priority

3. As required by **M.P.E.P. 201.14(c)**, acknowledgement is made of applicant's claim for priority based on applications filed on December 11, 2003.

Title

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

5. Claim(s) 2, 4-13, 17-18 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a claim 1. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s)

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in proper dependent form, or rewrite the claim(s) in independent form. Or rewrite claim 1 in a way to include all of the steps in part c) and not limiting this part to one of steps 1, 2 and 3.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 37-40 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 37-40 are directed to a computer program. A computer program is not considered a process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim(s) 1-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Craft et al. Patent No. (US. 7,124,205 B2).

As per claim 1, Craft et al. teaches a method of handling a data transfer in a network interface controller (NIC) (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60) the method comprising the steps of:

a) receiving the data transfer wherein the data transfer is denoted as one of a first type and a second type (first packet includes first data and second packet includes a second data Col. 37, Line 27; Col. 37, Line 44; Col. 44, Line 10; FIGs. 5, 17. 26) ;

b) calculating a cyclical redundancy check (CRC) for the data transfer (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61), wherein the CRC is one of valid and invalid (the NIC validate the packet Col. 8, Line 10; FIG. 3); and

c) conducting one of:

1) dropping the data transfer and not confirming reception (dropping the received data Col. 23, Line 8; Col. 40, Line 50) ;

2) placing the data transfer to a reassembly buffer of the NIC (the NIC queues the packets in a reassembly buffer Col. 22, Line 67); and

3) placing the data transfer to an internal buffer of the NIC for direct data placement to a destination buffer (frame buffers for receiving and transmitting packets to a network Col. 7, Line 21; Col. 10, Line 4,49; Col 14, Line 17; FIGs. 1-3).

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As per claim 2, Craft et al. teaches the method of claim 1 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60) , wherein step c), 2) (the NIC queues the packets in a reassembly buffer Col. 22, Line 67) is conducted in the case that the data transfer is of the first type (first packet response is used to identify the data transferred Col. 40, Line 3-26; Col 39, Line 49; FIGs. 9, 11, 17, 25).

As per claim 3, Craft et al. teaches the method of claim 1 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), further comprising the step of determining whether the data transfer includes a single or multiple direct data placement (DDP) segments (the NIC performs determination of message type before transferring the data Col. Col. 17, Line 17; FIG. 3).

As per claim 4, Craft et al. teaches the method of claim 3 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein step c), 3) (frame buffers for receiving and transmitting packets to a network Col. 7, Line 21; Col. 10, Line 4,49; Col 14, Line 17; FIGs. 1-3) is conducted in the case that the data transfer includes multiple DDP segments (NIC processes the multiple packets and multiple TCP, IP Col. 18, Line 7) and all DDP segments have a valid CRC (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61) that is fully contained in a TCP segment (the TCP headers are validated before processing Col 16, Line 16; FIG. 3).

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As per claim 5, Craft et al. teaches the method of claim 3 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein step c), 1) (dropping the received data Col. 23, Line 8; Col. 40, Line 50) is conducted in the case that the data transfer includes multiple DDP segments (NIC processes the multiple packets and multiple TCP, IP Col. 18, Line 7), a first DDP segment has an invalid CRC (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61), and a DDP header of the first DDP segment is referred by an MPA length associated with a previous DDP segment (the TCP headers length are validated before processing Col 16, Line 16; FIG. 3).

As per claim 6, Craft et al. teaches the method of claim 5 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein, in the case that the data transfer includes multiple DDP segments (NIC processes the multiple packets and multiple TCP, IP Col. 18, Line 7), a first DDP segment has an invalid CRC transfer (the header packets are processed and undergo cyclical redundancy checking in the NIC Col. 2, Line 61), and the DDP header of the first DDP segment is not referred by the MPA length associated with the previous DDP segment (the network sequencer validates the header length received and checksums the header Col. 15, Line 51; FIGs. 10, 11, 25):

step c), 1) (dropping the received data Col. 23, Line 8; Col. 40, Line 50) is conducted in the case that the DDP header is referred by an MPA marker (TCP headers contains flags for reset and fin that may cause the processor Col. 16, Line 17; FIG. 11); and

step c), 2) (the NIC queues the packets in a reassembly buffer Col. 22, Line 67) is conducted in the case that the DDP header is not referred by the MPA marker (the network sequencer validates the header length received and checksums the header Col. 15, Line 51; FIGs. 10, 11, 25).

As per claim 7, Craft et al. teaches the method of claim 3 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein step c), 1) (dropping the received data Col. 23, Line 8; Col. 40, Line 50) is conducted in the case that the data transfer includes multiple DDP segments (NIC processes the multiple packets and multiple TCP, IP Col. 18, Line 7) and a last DDP segment extends outside of the TCP segment boundary (adapter that have the ability to process several types of protocols over TCP Col. 14, Line 40; FIG. 9);

and step c), 2) (the NIC queues the packets in a reassembly buffer Col. 22, Line 67) is conducted in the case that the data transfer includes multiple DDP segments (NIC processes the multiple packets and multiple TCP, IP Col. 18, Line 7) and a last DDP segment does not extend outside of the TCP segment boundary (adapter that have the ability to process several types of protocols over TCP Col. 14, Line 40; FIG. 9).

As per claim 8, Craft et al. teaches the method of claim 2 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein step c), 2) (the NIC queues the packets in a reassembly buffer Col. 22, Line 67) is conducted in the case that the data transfer includes a single DDP segment (data maybe transferred from one NIC to another which involves a single

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transfer Col. 13, Line 10; FIG. 6) and an MPA length associated with the single DDP segment (TCP headers contains flags for reset and fin that may cause the processor Col. 16, Line 17; FIG. 11) is greater than a transmission control protocol (TCP) segment length of the data transfer (the network sequencer validates the header length received and checksums the header Col. 15, Line 51; FIGs. 10, 11, 25).

As per claim 9, Craft et al. teaches the method of claim 2 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein step c), 3) (frame buffers for receiving and transmitting packets to a network Col. 7, Line 21; Col. 10, Line 4,49; Col 14, Line 17; FIGs. 1-3) is conducted in the case that the data transfer includes a single DDP segment (data maybe transferred from one NIC to another which involves a single transfer Col. 13, Line 10; FIG. 6) that has: an MPA length associated therewith that equals a TCP segment length (the network sequencer validates the header length received and checksums the header Col. 15, Line 51; FIGs. 10, 11, 25) and a valid CRC (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61).

As per claim 10, Craft et al. teaches the method of claim 2 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein step c), 1) (dropping the received data Col. 23, Line 8; Col. 40, Line 50) is conducted in the case that the data transfer includes a single DDP segment (data maybe transferred from one NIC to another which involves a single transfer Col. 13, Line 10; FIG. 6) that has: an MPA length associated therewith that equals a TCP segment length (the network sequencer validates the header length received and

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checksums the header Col. 15, Line 51; FIGs. 10, 11, 25), an invalid CRC and a DDP header (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61) that is referred by an MPA length associated with a previous DDP segment (the NIC performs determination of message type before transferring the data Col. Col. 17, Line 17; FIG. 3).

As per claim 11, Craft et al. teaches the method of claim 2 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein in the case that the data transfer includes a single DDP segment (data maybe transferred from one NIC to another which involves a single transfer Col. 13, Line 10; FIG. 6) that has: an MPA length associated therewith that equals a TCP segment length (the network sequencer validates the header length received and checksums the header Col. 15, Line 51; FIGs. 10, 11, 25), an invalid CRC and a DDP header that is not referred by an MPA length associated with a previous DDP segment (the header packets are processed and undergo cyclical redundancy checking in the NIC Col. 2, Line 61):

step c), 1) (dropping the received data Col. 23, Line 8; Col. 40, Line 50) is conducted in the case that the DDP header is referred by an MPA marker (TCP headers contains flags for reset and fin that may cause the processor Col. 16, Line 17; FIG. 11); and

step c), 2) (the NIC queues the packets in a reassembly buffer Col. 22, Line 67) is conducted in the case that the DDP header is not referred

by an MPA marker (the network sequencer validates the header length received and checksums the header Col. 15, Line 51; FIGs. 10, 11, 25).

As per claim 12, Craft et al. teaches the method of claim 1 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), further comprising the step of setting the data transfer type to the first type when step c), 2) is conducted (first packet response is used to identify the data transferred Col. 40, Line 3-26; Col 39, Line 49; FIGs. 9, 11, 17, 25).

As per claim 13, Craft et al. teaches the method of claim 1 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein in the case that step c), 3) (frame buffers for receiving and transmitting packets to a network Col. 7, Line 21; Col. 10, Line 4,49; Col 14, Line 17; FIGs. 1-3) is conducted on an out-of-order data transfer (the processor in the NIC checks for fragmented or out of order packets Col. 11, Line 3; Col. 22, Line 66) , the method further comprises the steps of:

clearing TCP hole information created by the out-of-order data transfer in a connection context (packet processing sequencer clears bits from the summary queue Col. 35, Line 45; FIG 25); and

stopping receipt reporting for the out-of-order data transfer (protocol management that control the NIC access to the network and receipt of packets Col. 14, Line 66; Col. 14, Line 35; FIGs 1, 10).

As per claim 14, Craft et al. teaches the method of claim 1 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20,

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Line 9-60), wherein the data transfer includes DDP segments (the NIC performs determination of message type before transferring the data Col. Col. 17, Line 17; FIG. 3), and the calculating step includes calculating a CRC for all DDP segments of the data transfer together (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61).

As per claim 15, Craft et al. teaches the method of claim 14 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein the data transfer does not contain an MPA marker (processing data transfer, Abstract; FIGs. 3-4, 28).

As per claim 16, Craft et al. teaches the method of claim 14 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), further comprising the steps of: storing a number of retransmission attempts for each data transfer including an error; and storing a largest sequence number (file server that stores and retrieves files Col. 1, Line 58; Col. 6, Line 41; Col. 20, Line 27 FIG. 3).

As per claim 17, Craft et al. teaches the method of claim 16 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein in the case that CRC is invalid for the data transfer (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61), which indicates the data transfer is a newly received error-including data transfer (the packet control sequencer includes all information and any errors or data overflow in the buffer Col. 16, Line 47; FIGs. 10-11):

step c), 2) (the NIC queues the packets in a reassembly buffer Col. 22, Line 67) is conducted on the newly received error-including data transfer in the case that the number of retransmission attempts exceeds a maximum retransmission attempt number for that data transfer (the packet control sequencer for error processing before transmitting or storing in buffer Col. 16, Line 47; FIGs. 10-11), and

step c), 1) (dropping the received data Col. 23, Line 8; Col. 40, Line 50) is conducted on the newly received error-including data transfer in the case that the number of retransmission attempts does not exceed a maximum retransmission attempt number for that data transfer (the packet control sequencer for error processing before transmitting or storing in buffer Col. 16, Line 47; FIGs. 10-11); and

wherein in the case that step c), 1) (dropping the received data Col. 23, Line 8; Col. 40, Line 50) is conducted, the method further comprises the steps of:

increasing the number of retransmission attempts for the newly received error-including data transfer by one (error control in each phase for error handling Col. 28, Line 7, 29; Col. 40, Line 61) that ; and

updating the largest sequence number to carry the largest sequence number among at least one previously received error-including data transfer and the newly received error-including data transfer (error

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control in each phase for error handling Col. 28, Line 7, 29; Col. 40, Line 61).

As per claim 18, Craft et al. teaches the method of claim 16 (a network interface device for data transfer in a network, Abstract, Col. 1, Line 60; Col. 10, Line 30; Col. 20, Line 9-60), wherein in the case that CRC is valid for an in-order data transfer (the packets undergo cyclical redundancy checking in the NIC Col. 2, Line 61):

a) in the case that a sequence number of the in-order data transfer is greater than the stored largest sequence number (the communication control block 'CCB' maintains state information such as number of messages and order of packets that have been processed Col. 9, Line 13; Col. 11, Line 4; FIGs. 2-4), the number of retransmission attempts is reset and step c), 3) is conducted (frame buffers for receiving and transmitting packets to a network Col. 7, Line 21; Col. 10, Line 4,49; Col 14, Line 17; FIGs. 1-3); and

b) in the case that the sequence number of the in-order data transfer is not greater than the stored largest sequence number (the communication control block 'CCB' maintains state information such as number of messages and order of packets that have been processed Col. 9, Line 13; Col. 11, Line 4; FIGs. 2-4), step c), 3) is conducted (frame buffers for receiving and transmitting packets to a network Col. 7, Line 21; Col. 10, Line 4,49; Col 14, Line 17; FIGs. 1-3).

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Regarding claims 19-36 are related to the same limitation set for hereinabove, where the difference used is the phrase 'method' is used hereinabove in the claims. the citations from the prior art has been inserted where's necessary. Furthermore, the wordings of the claims were interchanged within the claim itself and this change does not effect the limitation of the above treated claims. The claim's limitations seemed to be repeated in many claims throughout the application. Even in the above treated claims many of the statements were just repeated from previously written claims within the application. Even though claims 19-36 have been differently written from the above treated claims, yet the limitations did not change. As mentioned, claim 19 is the same as claim 1 where the only difference is 'storage means' that was explained in claim 16 whereas claim 20 is the same as claim 2, claim 21 is the same as claim 3, claim 22 is the same as claim 4, claim 23 is the same as claim 5, claim 24 is the same as claim 6, claim 25 is the same as claim 7, claim 26 is the same as claim 8, claim 27 is the same as claim 9, claim 28 is the same as claim 10, claim 29 is the same as claim 11, claim 30 is the same as claim 12, claim 31 is the same as claim 13, claim 32 is the same as claim 14, claim 33 is the same as claim 15, claim 34 is the same as claim 16, claim 35 is the same as claim 17, claim 36 is the same as claim 18.

Regarding claims 37-40, Craft et al. teaches the claimed method in the above claims and also teaches the computer program to run that method as it has been treated hereinabove according to the claims . See claims 1-18 regarding claim 37-40 for more details.

Conclusion

The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant's art and those arts considered reasonably pertinent to applicant's disclosure. See **MPEP 707.05(c)**.

The following are analogous art because they are from the same field of endeavor network interface and data processing:

- Elzur. Pub. No.: (US-20040133713 A1)
- Starr et al. Pub. No.: (US-20040064590 A1)
- Boyd et al. Patent No.: (US- 7124205 B2)
- Boucher et al. Patent No.: (US-6247060 B1)
- Boucher et al. Patent No.: (US-6226680 B1)

The examiner requests, in response to this Office action, support should be shown for language added to any original claims on amendment and any new claims. That is, indicate support for newly added claim language by specifically pointing to page(s) and line(s) in the specification and/or drawing figure(s). This will assist the examiner in prosecuting the application.

When responding to this office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present, in view of the state of the

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art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections See 37 CFR 1.111(c).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdelnabi O. Musa whose telephone number is 571-2701901. The examiner can normally be reached on Monday Thru Friday: 7:30am to 5:00pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Pwu can be reached on 571-2726798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A.M


James K. Trujillo
PRIMARY EXAMINER
TC 2100